REMARKS

Claims 1-3, 5-7, 9, 11, 13-15 and 18-20 are pending. Claims 6, 8, 10 and 12 are canceled without prejudice or disclaimer to the subject matter therein.

Claim Objections

Claim 2 is objected to under 37 C.F.R. 1.75(c). Claim 2 has been amended, as needed, to overcome this objection. The attentiveness the Examiner has paid to this application is noted with appreciation.

Reconsideration and withdrawal of this objection are respectfully requested.

Claim Rejections - 35 U.S.C. §102

Claims 1-15 and 18-20 are rejected under 35 USC §102(e) as anticipated by or, in the alternative, under 35 USC §103(a) as obvious over Svilans (U.S. Patent No. 6,222,200.)

Independent claims 1, 18, 19 and 20 have been further amended to recite:

> "said first compressive strain in said first semiconductor layer has a magnitude exceeding 0.25%,
>
> wherein a sum of the second thicknesses of said second semiconductor layers is smaller than a sum of the first and second thicknesses by a factor of $(0.9 \times L^{1/4} \times \varepsilon)$, wherein ε represents the strain accumulated in said first semiconductor layer in terms of percent and L represents a sum of a total thickness of said first semiconductor layers in said photodetection later and a total thickness of said second semiconductor layers in said photodetection layer in terms of microns,
>
> said strain ε being set so as to achieve an optical absorption efficiency η of at least 50% when an optical radiation having a wavelength of 1620nm comes in at a temperature of -40℃."

By so amending, Applicants have introduced the feature of claim 4 and further clarified that the strain ε is set so as to achieve an optical absorption efficiency η of 50% or more when an optical radiation having a wavelength of 1620nm comes in at a temperature of -40℃.

First, it should be pointed out that the strain ε "exceeding 0.25%" does not overlap the strain (0.25%) of Svilans '200. In Svilans '200, the thickness of the active layer is optimized in the photodetection device of the InGaAs system so as to achieve a maximum optical absorption at a predetermined wavelength. Svilans '200 achieves this by suppressing formation of crystal defects, or misfit dislocations.

Contrary to Svilans '200, the present invention is based on the discovery of the "strain threshold" as to set forth in the paragraph spanning from page 9, line 32 to page 10, line 5 of the written specification. By imposing the "strain threshold," an excellent surface morphology is guaranteed in the present invention for the layered structure in which active layer of compressive strain and strain compensating layer of tensile strain are laminated alternately. In Svilans '200, the thickness of the active layer is controlled to be below the well known critical thickness used in a strained layered system formed of first and second, opposite strained layers. Consequently, there is a formation of misfit dislocations.

In addition to this difference in the underlying theory, the present invention achieves the optical absorption efficiency of 50% or more for the optical radiation having a wavelength of 1620nm at the temperature of -40℃, as set forth in amended claims 1, 18, 19 and 20.

It is noted that Svilans '200 merely addresses optimization of the active layer thickness

for the purpose of achieving maximum optical absorption at a predetermined wavelength, while the present invention is not attempting to achieve the maximum optical absorption. In fact, Svilans '200 describes in column 7, lines 45-51 that "Conveniently, the thicknesses of the active region layers 22 and 24 are optimized to provide maximum optical absorption over the required wavelength range. In applications where high responsivity is not a major issue, the thickness of the layers may be optimized to provide a pre-determined optical absorption and consequently a pre-determined responsivity of the photodetector.

This quoted portion of Svilans '200 indicates that the object of Svilans '200 is to maximize the optical absorption, contrary to the present invention as set forth in amended claims 1, 18, 19 and 20 and where there are various selections of layer thickness in achieving a pre-determined optical absorption as in the present invention. Therefore, the present invention is an entirely different invention from Svilans '200.

By so amending, independent claims 1, 18, 19 and 20 are patentably distinguished over the asserted prior art. All claims dependent thereon, are also patentably distinguished over the asserted prior art. Reconsideration and withdrawal of this rejection are respectfully requested.

CONCLUSION

In view of the aforementioned amendments and accompanying remarks, all pending claims are believed to be in condition for allowance, which action, at an early date, is requested.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 50-2866.

Respectfully Submitted,

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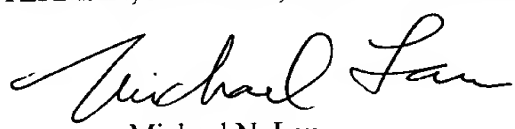

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